

REMARKS

Applicants appreciate the Examiner's thorough consideration provided the present application. Claims 1-10, 53 and 54 are now present in the application. Claim 54 has been added. Claims 1, 2 and 3 are independent. Reconsideration of this application, as amended, is respectfully requested.

Allowable Subject Matter

The Examiner fails to treat the combination of independent claim 2 and dependent claim 53 on the merit in the outstanding Office Action. Therefore, it is believed that the combination of independent claim 2 and dependent claim 53 is allowable.

However, if the Examiner raises new rejection(s) to the combination of independent claim 2 and dependent claim 53 in the next Office Action, the next Office Action must be made non-final because failure to treat the combination of independent claim 2 and dependent claim 53 on the merits and then finally rejecting the combination of independent claim 2 and dependent claim 53 in the next Office Action would be improper. Nonetheless, it is still believed that the combination of independent claim 2 and dependent claim 53 is allowable. Favorable consideration and allowance of the combination of independent claim 2 and dependent claim 53 are respectfully requested.

Information Disclosure Citation

Applicants have submitted the references supplied with the Information Disclosure Statement filed on September 12, 2008 for consideration by the Examiner. The Examiner is

courteously requested to provide Applicants with an initialed copy of the PTO-1449 form filed therewith with the next official communication.

Claim Rejections Under 35 U.S.C. § 103

Claims 1 and 3-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim, KR 100226831, in view of Parikh, U.S. Patent Application Publication No. US 2003/0015708. Claims 2 and 4-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim in view of in view of Parikh, and further in view of Ito, U.S. Patent Application Publication No. US 2002/0121637, and Uemura, U.S. Patent Application Publication No. 2003/0107053. Claims 1 and 3-10 [sic., 1, 3, 7 and 53] stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim in view of in view of Parikh, and further in view of Uemura. These rejections are respectfully traversed.

Complete discussions of the Examiner's rejections are set forth in the Office Action, and are not being repeated here.

Independent claim 1 recites a combination of element including "a GaN-based layer; a high concentration GaN-based layer formed on the GaN-based layer; a first metal-Ga compound layer formed on the high concentration GaN-based layer; a first metal layer formed on the first metal-Ga compound layer; a third metal-Al compound layer formed on the first metal layer; and a conductive oxidation preventive layer formed on the third metal-Al compound layer."

Independent claim 2 recites a combination of element including "a GaN-based layer; a high concentration GaN-based layer formed on the GaN-based layer; a transparent electrode layer formed above the high concentration GaN-based layer; a first metal-Ga compound layer

formed on the transparent electrode layer; a first metal layer formed on the first metal-Ga compound layer; a third metal-Al compound layer formed on the first metal layer; and a conductive oxidation preventive layer formed on the third metal-Al compound layer.”

Independent claim 3 recites a combination of element including “a GaN-based layer; a high concentration GaN-based layer formed on the GaN-based layer; a first metal-Ga-N compound layer formed on the high concentration GaN-based layer; a first metal layer formed on the first metal-Ga-N compound layer; a third metal-Al compound layer formed on the first metal layer; and a conductive oxidation preventive layer formed on the third metal-Al compound layer.”

Applicants respectfully submit that the above combinations of elements as set forth in independent claims 1-3 are not disclosed or suggested by the references relied on by the Examiner.

Kim in FIG. 1c discloses an GaN LED device having a N-typed GaN layer (2); a active layer (3) formed on the N-typed GaN layer (2); a high concentration p-typed GaN layer (4) formed on the active layer (3); a first Ti layer (5) formed on the P-typed GaN layer (4); an Al layer (8) formed on the first Ti layer (5); a second Ti layer (5) formed on the Al layer (8); and a Au layer (7) formed on the second Ti layer (5). Kim in FIG. 2c (another embodiment) discloses an LED device having a GaTi or GaTiN layer (15) and an Al layer (16) formed over the GaTi or GaTiN layer (15). However, Kim fails to disclose a high concentration GaN-based layer formed on a GaN-based layer as recited in claims 1-3. Although the Examiner referred to Kim’s P-typed GaN layer (4) as the high concentration GaN-based layer of claims 1 and 3, Kim nowhere discloses that the P-typed GaN layer (4) is a high concentration GaN-based layer.

In addition, Kim nowhere discloses a third metal-Al compound layer formed on a first metal layer as recited in claims 1-3. In particular, the Examiner on page 3, line 4 of the outstanding Office Action seemed to refer to the Cr layer 8 as the third metal-Al compound layer. In addition, the Examiner on page 3, line 5 of the outstanding Office Action seemed to change his position and referred to the Ti layer 5 as the third metal-Al compound layer (and the first metal layer). However, since neither the Cr layer 8 nor the Ti layer is a metal-Al compound layer, Kim also fails to teach a third metal-Al compound layer formed on a first metal layer as recited in claims 1-3.

Parikh also fails to cure the deficiencies of Kim. Parikh in FIG. 5 and paragraph [0054] discloses an gallium nitride based diodes (a GaN Schottky diode) having a substrate (51); a n+ GaN layer (52) on formed the substrate (51); a n- GaN layer (53) formed on the n+ GaN layer (51); a AlGaN barrier layer (54) formed on the n- GaN layer (53); a metal contact layer (56) formed on the AlGaN barrier layer (54). Although the Examiner referred to Parikh's n+ GaN layer (52) as a high concentration GaN-based layer, Parikh's n+ GaN layer (52) is formed on a substrate, not on a GaN-based layer as the claimed invention. Therefore, Kim in view of Parikh fails to teach or suggest a high concentration GaN-based layer formed on a GaN-based layer as the claimed invention.

In addition, Kim in view of Parikh fails to teach or suggest a third metal-Al compound layer formed on a first metal layer as the claimed of invention. In particular, the third metal-Al compound layer serves as a second diffusion barrier for suppressing a unwanted reaction of a material forming the conductive oxidation preventive layer and a lower electrode and a semiconductor, and serves to increase the thermal stability of the electrode (see paragraph 187).

However, Parikh's AlGaN barrier layer (54) is formed with a semiconductor layer on the GaN semiconductor layer (53). Accordingly, Parikh's AlGaN barrier layer (54) cannot be combined with Kim as a tunnel barrier.

Furthermore, Parikh's AlGaN barrier layer (54) is a *semiconductor layer*. Unlike Parikh, The third metal-Al compound layer of the claimed invention is *formed with Al compound and the third metal*, which is different from a semiconductor layer such as AlGaN disclosed in Parikh.

Uemura and Ito also fail to cure the deficiencies of Kim, Uemura and Ito are simply relied on for their teaching of an LED device having a translucent electrode over a Group III base layer. Uemura and Ito also fail to disclose the above combinations of elements as set forth in independent claims 1-3.

Accordingly, none of the utilized references individually or in combination teaches or suggests the limitations of independent claims 1-3. Therefore, Applicants respectfully submit that independent claims 1-3 clearly define over the teachings of the utilized references.

In addition, claims 4-10 and 53 depend, either directly or indirectly, from independent claims 1-3, and are therefore allowable based on their respective dependence from independent claims 1-3, which are believed to be allowable.

In view of the above remarks, Applicants respectfully submit that claims 1 -10 and 53 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103 are respectfully requested.

Additional Claim

Claim 54 has been added for the Examiner's consideration, which is directed to the elected Species. Applicants respectively submit that claim 54 depends from any one of independent claims 1-3, and is therefore allowable based on its dependence from independent claims 1-3, which are believed to be allowable. Consideration and allowance of claim 54 are respectfully requested.

CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

Application No.: 10/534,489
Amendment dated October 10, 2008
Reply to Office Action of July 10, 2008

Docket No.: 3449-0477PUS1

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Dated: October 10, 2008

Respectfully submitted,

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